# SmartSwitch Router 2100
# Getting Started Guide

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CABLETRON SYSTEMS

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35 Industrial Way
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UL 1950; CSA C22.2, No. 950; 73/23/EEC; EN 60950; IEC 950

## Electromagnetic

FCC Part 15; CSA C108.8; 89/336/EEC; EN 55022; EN 61000-3-2

## Compatibility (EMC)

EN 61000-3-3; EN 50082-1, AS/NZS 3548; VCCI V-3

# Regulatory Compliance Statements

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**NOTICE:** The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational, and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas. **CAUTION:** Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

**NOTICE:** The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

## VCCI Compliance Statement

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# Safety Information: Class 1 Laser Transceivers

**This product may use Class 1 laser transceivers. Read the following safety information before installing or operating this product.**

The Class 1 laser transceivers use an optical feedback loop to maintain Class 1 operation limits. This control loop eliminates the need for maintenance checks or adjustments. The output is factory set and does not allow any user adjustment. Class 1 laser transceivers comply with the following safety standards:

- 21 CFR 1040.10 and 1040.11, U.S. Department of Health and Human Services (FDA)
- IEC Publication 825 (International Electrotechnical Commission)
- CENELEC EN 60825 (European Committee for Electrotechnical Standardization)

When operating within their performance limitations, laser transceiver output meets the Class 1 accessible emission limit of all three standards. Class 1 levels of laser radiation are not considered hazardous.

## Laser Radiation and Connectors

When the connector is in place, all laser radiation remains within the fiber. The maximum amount of radiant power exiting the fiber (under normal conditions) is –12.6 dBm or $55 \times 10^{-6}$ watts.

Removing the optical connector from the transceiver allows laser radiation to emit directly from the optical port. The maximum radiance from the optical port (under worst case conditions) is 0.8 W $cm^{-2}$ or $8 \times 10^{3}$ W $m^{2}$ sr–1.

**Do not use optical instruments to view the laser output. The use of optical instruments to view laser output increases eye hazard. When viewing the output optical port, power must be removed from the network adapter.**

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| Full Name | Full Name |
| Principal Compliance Engineer | Managing Director, E.M.E.A. |
| Title | Title |
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# Preface

## About This Guide

This guide provides a general overview of the 8-Gigabit-port SmartSwitch Router (SSR 2100) hardware and software features and provides procedures for installing the SSR 2100 and setting it up for management using CoreWatch Element Management software. For product information not available in this guide, see the manuals listed in "Related Documentation" on page 2.

## Who Should Read This Guide?

Read this guide if you are a network administrator responsible for installing and setting up the SSR 2100.

**Note:** Only qualified personnel should perform the installation procedures in this guide.

## How to Use This Guide

| If You Want To | See |
|---|---|
| Get an overview of the SSR 2100 software and hardware features | Chapter 1, "Features Overview" on page 3 |
| Install the SSR 2100 hardware | Chapter 2, "Hardware Installation" on page 15 |
| Install and boot the software, and set up the SSR 2100 | Chapter 3, "Software Installation and Setup" on page 23 |
| Set up the SSR 2100 for management using CoreWatch | Chapter 4, "Installing and Starting Cabletron CoreWatch" on page 43 |
| Troubleshoot installation problems | Appendix A, "Troubleshooting" on page 49 |
| Contact Cabletron Systems for technical support | Appendix B, "Technical Support" on page 51 |

# Related Documentation

The Cabletron Systems documentation set includes the following items. Refer to these other documents to learn more about your product.

| For Information About | See the |
|---|---|
| Managing the SSR 2100 using the CoreWatch Element Management application | *CoreWatch User's Manual* and the CoreWatch online help |
| How to use Command Line Interface (CLI) commands to configure and manage the SSR 2100 | *SmartSwitch Router User Reference Manual* |
| The complete syntax for all CLI commands | *SmartSwitch Router Command Line Interface Reference Manual* |
| System messages | *SmartSwitch Router Error Reference Manual* |

# Chapter 1

# Features Overview

The 8-Gigabit-port SmartSwitch Router (SSR 2100) provides non-blocking, high-speed Layer-2 (switching), Layer-3 (routing), and Layer-4 (application) switching. This chapter provides a basic overview of the SSR 2100 software and hardware feature set.

- If you want to skip this information and install the SSR 2100 now, see Chapter 2, "Hardware Installation" on page 15.
- If you want to boot the SSR 2100 software and perform basic configuration tasks now, see Chapter 3, "Software Installation and Setup" on page 23.
- If you want to set up a management station for using CoreWatch, see Chapter 4, "Installing and Starting Cabletron CoreWatch" on page 43.

## Specifications

The SSR 2100 provides high-speed switching and full non-blocking throughput. The hardware provides high-speed performance regardless of the performance monitoring, filtering, and Quality of Service (QoS) features enabled by the software.

The following table lists the basic hardware and software specifications for the SSR 2100.

**Table 1. Basic hardware and software specifications**

| Feature | Specification |
|---|---|
| Throughput | • 8.0-Gbps non-blocking switching fabric<br>• 9.2 million packets-per-second routing throughput |
| Capacity | • Up to 50,000 routes<br>• Up to 256,000 Layer-4 application flows<br>• Up to 240,000 Layer-2 MAC addresses<br>• 4,096 Virtual LANs (VLANs)<br>• 2,000 Layer-2 security and access-control filters<br>• 3MB input/output buffering per Gigabit port |
| Routing protocols | • IP: RIP v1/v2, OSPF, BGP v2/v3/v4<br>• IPX: RIP, SAP<br>• Multicast: IGMP, DVMRP<br>• Network Address Translation<br>• Server Load Balancing<br>• Transparent Web Caching |
| Bridging and VLAN protocols | • 802.1d Spanning Tree<br>• 802.1Q (VLAN trunking) |
| Media Interface protocols | • 802.3z (1000Base-SX) |
| Quality of Service (QoS) | • Layer-2 prioritization (802.1p)<br>• Layer-3 source-destination flows<br>• Layer-4 source-destination flows<br>• Layer-4 application flows |
| RMON | • RMON v1/v2 for each port |
| Management | • SNMP<br>• CoreWatch Element Manager (GUI)<br>• Emacs-like Command Line Interface (CLI) |
| Port mirroring | • Traffic to specific Gigabit ports |

This guide and other SSR 2100 documentation refers to the SSR 2100's Layer-2, Layer-3, and Layer-4 switching and routing. These layers are based on the International Standards Organization (ISO) 7-layer reference model. Here is an example of that model. The SSR 2100 operates within the layers that are not shaded. Notice that Layer-2 is divided into an LLC layer and a MAC layer. The SSR 2100 operates at the MAC layer but not the LLC layer.

| | |
|---|---|
| Layer 7 | Application |
| Layer 6 | Presentation |
| Layer 5 | Session |
| Layer 4 | TCP/UDP - application |
| Layer 3 | IP/IPX - routing |
| Layer 2 | LLC |
| Layer 2 | MAC -bridging |
| Layer 1 | Physical Interfaces |

## TCP/UDP Services

The following table lists some well known TCP/UDP services provided by the SSR 2100.

**Table 2. TCP/UDP services**

| TCP Port | UDP Port | Description |
|---|---|---|
| 23 | | Telnet |
| | 161 | SNMP |
| | 67 | BOOTP/DHCP Relay Agent |
| | 520 | Routed |

# Features

This section describes the following SSR 2100 features:

- Address-based and flow-based bridging
- Port-based VLANs and protocol-based VLANs
- IP and IPX routing

- Layer-4 (application) switching
- Security
- Quality of Service (QoS)
- Statistics
- Management

## Bridging

The SSR 2100 provides the following types of high-speed bridging:

- **Address-based bridging** – The SSR 2100 performs this type of bridging by looking up the destination address in an L2 lookup table on the Gigabit port that receives the bridge packet from the network. The L2 lookup table indicates the exit port(s) for the bridged packet. If the packet is addressed to the SSR 2100's own MAC address, the packet is routed rather than bridged.
- **Flow-based bridging** – The SSR 2100 performs this type of bridging by looking up an entry in the L2 lookup table containing both the source and destination addresses of the bridge packet.

Your choice of bridging method does not affect SSR 2100 performance. However, address-based bridging is more efficient because it requires fewer table entries while flow-based bridging provides tighter management and control over bridged traffic.

The SSR 2100 ports perform address-based bridging by default, but can be configured to perform flow-based bridging instead of address-based bridging on a per-port basis. A port cannot be configured to perform both types of bridging at the same time.

## Port and Protocol VLANs

The SSR 2100 supports the following types of Virtual LANs (VLANs):

- **Port-based VLANs** – A port-based VLAN is a set of ports that comprises a Layer-2 broadcast domain. The SSR 2100 confines MAC-layer broadcasts to the ports in the VLAN on which the broadcast originates. SSR 2100 ports outside the VLAN do not receive the broadcast.
- **Protocol-based VLANs** – A protocol-based VLAN is a named set of ports that comprises an IP or IPX broadcast domain. The SSR 2100 confines IP or IPX broadcasts to the ports within the IP or IPX based VLAN. Protocol-based VLANs sometimes are called subnet VLANs or Layer-3 VLANs.

You can include the same port in more than one VLAN, even in both port-based and protocol-based VLANs. Moreover, you can define VLANs that span across multiple SSR 2100s. To simplify VLAN administration, the SSR 2100 supports 802.1q trunk ports,

which allow you to use a single port to “trunk” traffic from multiple VLANs to another SSR 2100 or switch which supports 802.1q.

## Routing

The SSR 2100 provides high-speed routing for the following protocols:

- **Internet Protocol (IP)** – the protocol switching and routing devices use for moving traffic within the Internet and within many corporate intranets.
- **Internet Packet Exchange (IPX)** – a protocol by Novell used in Netware products.

**Note:** All other protocols that require routing must be tunneled using IP.

By default, the SSR 2100 uses one MAC address for all interfaces. The SSR 2100 can be configured to have a separate MAC address for each IP interface and a separate MAC address for each IPX interface. When the SSR 2100 receives a packet whose destination MAC address is one of the SSR 2100’s IP or IPX interface MAC addresses, the port that received the packet from the network uses information in the module’s L3 lookup tables (or information supplied by the motherboard) to route the packet to its IP destination(s).

You can create only one IP and IPX interface on a single port or VLAN. You can add secondary IP addresses to the same IP interface. When you add an interface to a set of ports, you are adding a VLAN to those ports. Ports that contain IP and IPX interfaces can still perform Layer-2 bridging.

### IP Routing

The SSR 2100 supports the following IP unicast routing protocols:

- RIP v1 and RIP v2
- OSPF v2
- BGP v2/v3/v4

IP interfaces do not use a specific routing protocol by default. When you configure an interface for routing, you also specify the routing protocol the interface will use.

### IP Multicast Routing

The SSR 2100 supports the following IP multicast routing protocols:

- IGMP v1 and IGMP v2
- DVMRP v3

The SSR 2100 does not use a specific IP Multicast routing protocol by default. Configuring an interface for IP Multicast simultaneously specifies its routing protocol.

### IPX Routing

The SSR 2100 supports the following IPX routing protocols:

- IPX RIP – a version of the Routing Information Protocol (RIP) tailored for IPX
- IPX SAP – the Service Advertisement Protocol, which allows hosts attached to an IPX network to reach printers, file servers, and other services

By default, IPX routing is enabled on the SSR 2100 when an IPX interface is created.

## Layer-4 Switching

In addition to Layer-2 bridging and Layer-3 routing, the SSR 2100 performs Layer-4 switching. Layer-4 switching is based on applications and flows.

- **Layer-4 applications** – The SSR 2100 understands the application for which an IP or IPX packet contains data and therefore enables you to manage and control traffic on an application basis. For IP traffic, the SSR 2100 looks at the packet's TCP or UDP port number to determine the application. For IPX packets, the SSR 2100 looks at the destination socket to determine the application.
- **Layer-4 flows** – The SSR 2100 can store Layer-4 flows in each Gigabit port. A Layer-4 flow consists of the source and destination addresses in the IP or IPX packet combined with the TCP or UDP source and destination port number (for IP) or the source and destination socket (for IPX). You can therefore manage and control individual flows between hosts on an individual application basis.

A single host can have many individual Layer-4 entries in the SSR 2100. For example, an IP host might have separate Layer-4 application entries for email, FTP, HTTP, and so on, or separate Layer-4 flow entries for specific email destinations and for specific FTP and Web connections.

## Security

The bridging, routing, and application (Layer-2, Layer-3, and Layer-4) support described in previous sections enables you to implement security filters that meet the specific needs of your organization. You can implement the following types of filters to secure traffic on the SSR 2100:

- Layer-2 source filters (block bridge traffic based on source MAC address)
- Layer-2 destination filters (block bridge traffic based on destination MAC address)
- Layer-2 flow filters (block bridge traffic based on specific source-destination pairs)
- Layer-3 source filters (block IP or IPX traffic based on source IP or IPX address)
- Layer-3 destination filters (block IP or IPX traffic based on destination IP or IPX address)

- Layer-3 flow filters (block IP or IPX traffic based on specific source-destination pairs)
- Layer-4 application filters (block traffic based on UDP or TCP source and destination ports for IP or source and destination sockets for IPX)

## Quality of Service

Although the SSR 2100 supplies non-blocking high-speed throughput, you can configure the SSR 2100 to apply Quality of Service (QoS) policies during peak periods to guarantee service to specific hosts, applications, and flows (source-destination pairs). This is especially useful in networks where the traffic level can exceed the network medium's capacity.

The SSR 2100 QoS is based on four queues: control, high, medium, and low. Control traffic has the highest priority, high the second highest, and so on. The default priority for all traffic is low.

You can configure QoS policies for the following types of traffic:

- Layer-2 prioritization (802.1p)
- Layer-3 and Layer-4 application flows

## Statistics

The SSR 2100 can provide extensive statistical data on demand. You can access the following types of statistics:

- Layer-2 RMON and MIB II Statistics – Port statistics for normal packets and for errors (packets in, packets out, CRC errors, and so on)
- Layer-3 RMON v2 Statistics – Statistics for ICMP, IP, IP-interface, IP routing, IP multicast, VLAN
- Layer-4 RMON v2 Statistics – Statistics for TCP and UDP

## Management Platforms

You can manage the SSR 2100 using the following management platforms:

- Command Line Interface (CLI) – An EMACs editor-like interface that accepts typed commands and responds when applicable with messages or tables. You will use the CLI to perform the basic setup procedures described in Chapter 3 of this guide.
- CoreWatch – Cabletron Systems' Java-based device management software. CoreWatch provides a graphical interface to the SSR 2100, providing most of the same monitoring and control features as the CLI.

- SNMP MIBs and traps – The SSR 2100 supports SNMP v1 and many standard networking MIBs. You can access the SSR 2100's SNMP agent using Cabletron integration software for HP OpenView 5.x on Windows NT or Solaris 2.x, or Cabletron Spectrum on Solaris 2.x. Chapter 3, "Software Installation and Setup" on page 23 in this guide explains how to set up SNMP on the SSR 2100. Chapter 4, "Installing and Starting Cabletron CoreWatch" on page 43 explains how to access the SSR 2100's SNMP agents.

# Hardware Overview

This section describes the SSR 2100's hardware specifications. Chapter 2, "Hardware Installation" on page 15 in this guide describes how to install the hardware. This section describes the following hardware:

- Chassis and external controls
- Motherboard features
- Power supplies
- Gigabit ports

## Chassis

The SSR 2100 chassis contains eight Gigabit Ethernet (1000Base-SX) ports. The SSR 2100's configuration is fixed at eight Gigabit ports. No expansion modules are available. Figure 1 shows the front view of an SSR 2100 chassis.

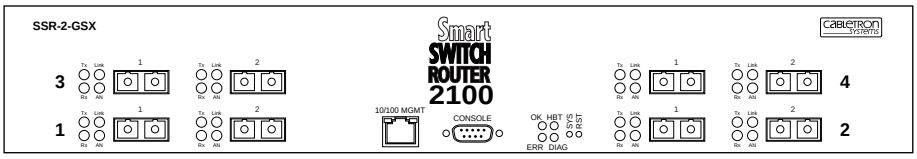


**Figure 1. Front view of an SSR 2100 chassis**

### External Controls

The SSR 2100 has the following external controls. Where appropriate, this guide describes how to use the controls.

- A Male DB-9 Data Communications Equipment (DCE) port for serial connection from a management terminal. Use this port to establish a direct CLI connection to the SSR 2100. The default baud rate is 9600.
- A 10Base-T/100Base-TX Data Terminal Equipment (DTE) port for network connection from a management terminal. The port is configured as Media Data Interface (MDI).

Use this port to establish a CoreWatch management connection to the SSR 2100 over a local or bridged Ethernet segment.

- A Reset switch (RST). Use this switch to reboot the SSR 2100's motherboard from the internal boot flash in the event of a system failure. The Reset switch is recessed in the SSR 2100's chassis, so you will have to use a tool like a small allen wrench to activate the switch.
- System switch (SYS). This switch stops the system software and starts the debugger. Normally, you should not use this switch unless directed to do so by Cabletron Systems personnel.
- Status LEDs, described in the following table:

**Table 3. Status LEDs**

| LED Label | Description |
|---|---|
| OK | When this LED is on, the SSR 2100 and all Gigabit ports are functioning correctly. |
| ERR | When this LED is on, a fatal system error has occurred. Activate the SSR 2100's boot PROM to reboot the router. |
| HBT | This LED flashes when the SSR 2100's boot PROM is active. |
| DIAG | When this LED is on, the SSR 2100 is in diagnostic mode. (While in diagnostic mode, several other LEDs on the SSR 2100 are active as well.) |

## Motherboard Features

The internal "motherboard" performs all the SSR 2100's computing and routing functions. It contains system-wide bridging and routing tables. Traffic that does not yet have an entry in the L2 and L3/L4 lookup tables on individual Gigabit ports is handled by the motherboard. After processing traffic, the motherboard updates the L2 and L3/L4 tables on the Gigabit ports that received the traffic. The Gigabit ports thus "learn" about how to forward traffic.

### Boot Flash

The motherboard has a boot flash containing the SSR 2100's boot software and configuration files. The system software image file resides on an internal flash chip and can be upgraded from a TFTP server.

### RAM Memory

The SSR 2100's motherboard uses 64 megabytes of RAM to hold routing and other tables. To upgrade the amount of memory on the SSR 2100, contact your Cabletron representative.

## Power Supplies

The SSR 2100 uses two power supplies, each delivering 3.3, 5, and 12 volts DC to the motherboard, internal fans, and other components. Each power supply provides a portion of the power necessary to operate the SSR 2100, with the added feature that, in the unlikely event that one of the power supplies should fail, the remaining power supply will assume the entire load and provide enough current to operate a fully configured SSR 2100 chassis.

**Note:** Be sure to plug the SSR 2100 into a single-phase grounded power source located within 6 feet of the installation site.

The following table lists the specifications for the power supplies.

**Table 4. Power supply voltage and current specifications**

| Input voltage | Input current (maximum) |
|---|---|
| 100-125 VAC | 2.6 A |
| 200-240 VAC | 1.3 A |

## Fans

The SSR 2100 contains three internal fans to provide cooling air flow across the motherboard and Gigabit ports. The fans are located near the middle of the chassis, between the power supplies and the motherboard.

**Note:** To ensure that the fans can provide adequate cooling, Cabletron recommends that you allow a minimum of 3 inches of clearance on each side of the chassis.

## Gigabit Ports

The SSR 2100's eight Gigabit (1000Base-SX) Ethernet ports are indexed into four groups of two ports each. The ports connect can operate in full-duplex or half-duplex mode. Each port can be configured as a switched port or a routed port. The ports have short wave (850 nm) lasers and connect to multimode-mode fiber (MMF) cables.

Figure 2 shows the front panel of two of the Gigabit ports.

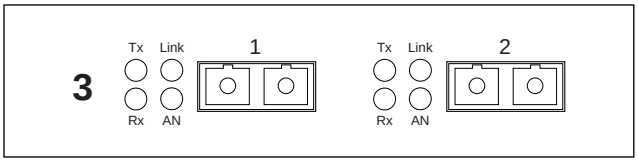


**Figure 2. Front panel of Gigabit ports**

### Cabling and Connector Specifications

The following table lists the media specifications for the Gigabit ports:

**Table 5. Gigabit port specifications**

| Port type | Specification |
|---|---|
| 1000Base-SX | • 802.3z standard (also uses 802.3x for flow control)<br>• SC-style Media Interface Connector (MIC)<br>• 62.5 micron or 50 micron multimode fiber-optic cable<br>• Maximum 275 meters (902 feet) segment length for 62.5 micron fiber-optic cable, based on installed fiber bandwidth<br>• Maximum 550 meters (1804 feet) segment length for 50 micron fiber-optic cable, based on installed fiber bandwidth |

### LEDs

The Gigabit ports use the following LEDs.

**Table 6. Gigabit port LEDs**

| LED | Description |
|---|---|
| Per-port Link | • Green – indicates that the port hardware detects a cable plugged into the port and a good link is established.<br>• Red (intermittent) – indicates that the port received an error during operation.<br>• Red (solid) – indicates that the port hardware detects a cable plugged into the port, however, a bad link is established.<br>• Off – indicates that no link from exists with the port. |

**Table 6. Gigabit port LEDs (Continued)**

| LED | Description |
|---|---|
| Per-port Rx | • Green – indicates when the port's transceiver receives packets.<br>• Orange – indicates when the port's transceiver receives flow-control packets. |
| Per-port Tx | • Green – indicates when the port's transceiver transmits packets.<br>• Orange – indicates when the port's transceiver transmits flow-control packets. |
| Per-port AN | • Green – indicates that the Gigabit port is autonegotiating the operating mode of the link between full-duplex and half-duplex.<br>• Orange (intermittent) – indicates that autonegotiation is in process.<br>• Orange (solid) – indicates a problem with autonegotiation configuration.<br>• Red – indicates an autonegotiation failure. This fault may occur if the link partner does not support full duplex.<br>• Off – indicates that autonegotiation has been disabled or the link is down. |

# Chapter 2

# Hardware Installation

This chapter provides hardware installation information and procedures in the following sections:

- Safety considerations
- Hardware specifications
- Installing the hardware

If the hardware is already installed and you are ready to install the software and perform basic system configuration, see Chapter 3, "Software Installation and Setup" on page 23.

## Safety Considerations

Read the following safety warnings and product cautions to avoid personal injury or product damage.

### Preventing Injury

Observe the following safety warnings to prevent accidental injury when working with the SSR 2100 hardware.

- To avoid back strain, be careful when lifting the SSR 2100 out of the shipping box.
- Never attempt to rack mount the SSR 2100 unaided. Ask an assistant to help you hold the SSR 2100.

- Before performing any upgrade or installation procedures, ensure that the SSR 2100 is powered off.
- Never operate the SSR 2100 if the it becomes wet or the area where it has been installed is wet.

## Preventing Equipment Damage

Observe the precautions listed in this section to prevent accidental damage to the SSR 2100 components.

**Caution:** To prevent accidental product damage, observe the following precautions:

- Always use proper electrostatic discharge (ESD) gear when handling internal parts of the chassis.
- Make sure you allow adequate room for air flow around the SSR 2100.

# Hardware Specifications

The following table lists the physical and environmental specifications for the SSR 2100.

**Table 7. SSR 2100 physical and environmental specifications**

| | |
|---|---|
| Dimensions | Inches: 2.8″ (height) x 17″ (width) x 18.5″ (depth)<br>Centimeters: 7.1cm x 43.2cm x 47cm |
| Weight | Pounds: 22<br>Kilograms: 10 |
| Power | 100-125 VAC, 2.6 A maximum;<br>200-240 VAC, 1.3 A maximum |
| Operating temperature | Fahrenheit: 41°F to 104°F<br>Centigrade: 5°C to 40°C |

# Installing the Hardware

This section describes how to perform the following tasks:

- Verifying your shipment
- Installing the chassis (on a tabletop or in an equipment rack)

- Attaching console management cables
- Attaching port cables

## Verifying Your Shipment

Before you begin installing your SSR 2100, check your shipment to ensure that everything you ordered arrived securely. Cabletron assembles the SSR 2100 according to one of the configurations under "Chassis" on page 10 before shipping.

**Caution:** To avoid back strain, be careful when lifting the SSR 2100 out of the shipping box.

Open the shipping box(es) and verify that you received the following equipment:

- An SSR 2100, power cord(s), and a console cable. The console cable is used for connecting a terminal to the SSR 2100's console port.
- One copy of the *SmartSwitch Router 2100 Getting Started Guide* (the book you are reading now).
- An SSR Documentation CD-ROM, including current version release notes.
- An SSR 2100 software kit with a CD-ROM containing the CoreWatch element management software and user documentation (in a separate box).
- Rack mount kit, including two rack mounting brackets and fastening screws.

## Installing the Chassis

Cabletron recommends that only qualified personnel conduct installation of any SSR chassis.

**Warning:** Before performing any upgrade or installation procedures, ensure that the SSR 2100 is powered off.

This section contains procedures for the following types of installation:

- Table-top installation
- Rack mount installation

### Table-Top Installation

You can install the SSR 2100 on a tabletop.

1. Select a table that is stable (not wobbly) and is not in an area subject to frequent foot traffic. Remember that you will be attaching numerous cables to the SSR 2100.

2. Place the SSR 2100 on the table, allowing at least 3” of space on each side for adequate air flow to the cooling fans.

### Rack Mount Installation

You can install the SSR 2100 in a standard 19” equipment rack. The SSR 2100 chassis contains screw holes for front-mounting brackets.

**Note:** Never attempt to rack mount the SSR 2100 unaided. Ask an assistant to help you hold the chassis.

To install the SSR 2100 chassis in an equipment rack, use the following procedure. You need a phillips-head screwdriver to perform this procedure.

Figure 3 shows an example of how to install the SSR 2100 in an equipment rack. The procedure following the figure describes how to install the SSR 2100 in an equipment rack.

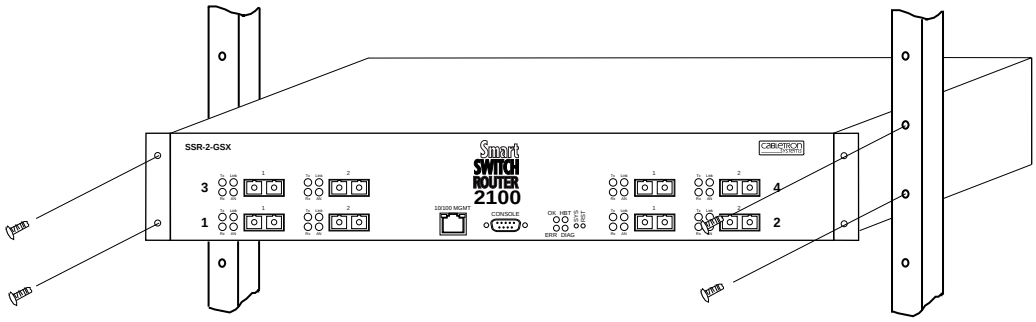


**Figure 3. Installing the SSR 2100 chassis in an equipment rack**

To install the SSR 2100 in an equipment rack:

1. If your SSR 2100 is not already equipped with rack-mounting brackets, take the following steps. Otherwise skip to Step 2.

    a. Remove the two screws that help hold the front panel of the SSR 2100 on to the rest of the chassis. There is one screw located on each side of the chassis very near the front of the SSR 2100. These screws will be reused to help hold the rack mounting brackets to the SSR 2100.

    b. Align one of the mounting brackets over the corresponding holes in the side of the SSR 2100. The mounting bracket is correctly positioned when the side with two open mounting holes is flush with the front of the SSR 2100.

    c. Use the phillips-head screwdriver and the supplied phillips-head screws to attach the mounting bracket to both the side and bottom of the chassis. (There are four holes for each rack mounting bracket—the one on the side of the chassis that you exposed in Step a, and three holes in the bottom of the chassis.)

**Note:** Be sure to use the phillips-head screws supplied by Cabletron. If you use screws that are longer than the ones included with your shipment, there is a danger of damaging the SSR 2100's internal components.

d. Attach the other mounting bracket.

2. Along with an assistant, lift the SSR 2100 into place in the mounting rack.
3. While your assistant holds the chassis in place, use the phillips-head screwdriver and four phillips-head screws to attach the mounting brackets to the mounting rack.

**Caution:** Make sure the screws are tight before your assistant releases the chassis. If you accidentally leave the screws loose, the chassis can slip and fall, possibly becoming damaged.

## Attaching the Console Management Cables

The SSR 2100 has two ports for attaching management consoles to the SSR 2100.

- A male DB-9 DCE port for direct serial connection from a terminal. Use this port to perform basic setup, including setting up the SSR 2100 for management through the network using CoreWatch or SNMP.
- An RJ-45 10/100Base-T DTE port for Telnet connection from a host on the network. The port is configured for Media Data Interface (MDI). You use this port to manage the SSR 2100 using CoreWatch or SNMP.

### Connecting to the Serial Port

To attach the supplied console cable to the SSR 2100's DB-9 port (marked "CONSOLE" on the SSR 2100's chassis):

1. Locate the console cable included with the SSR 2100 chassis. The console cable is a female to female DB-9 crossover cable that has the following pin assignments:

**Table 8. DB-9 connector pin assignments**

| Signal (SSR 2100 port) | Pin | Signal (management console port) |
|---|---|---|
| Unused | 1 | Unused |
| TXD (transmit data) | 2 | RXD (receive data)[a] |
| RXD (receive data) | 3 | TXD (transmit data) |
| Unused | 4 | Unused |
| GND (ground) | 5 | GND (ground) |

**Table 8. DB-9 connector pin assignments**

| Signal (SSR 2100 port) | Pin | Signal (management console port) |
|---|---|---|
| DTR (data terminal ready) | 6 | DTR (data terminal ready) |
| CTS (clear to send) | 7 | CTS (clear to send) |
| RTS (request to send) | 8 | RTS (request to send) |
| Unused | 9 | Unused |

a. The left hand column pin assignments are for the male DB-9 connector on the SSR 2100. Thus, pin 2 (TXD or "transmit data") must emerge on the management console's end of the connection as RXD ("receive data") and so on.

2. Plug one end of the console cable into the SSR 2100's DCE DB-9 port .
3. Plug the other end of the console cable into the management console's DTE port.
4. When you are ready to begin configuring the SSR 2100, use procedures in Chapter 3, "Software Installation and Setup" on page 23 to power on the switch and boot the software. You will perform initial setup by entering CLI commands on the management console.

### Connecting to the 10/100Base-TX Port

Use the RJ-45 10/100Base-TX DTE port for Telnet connection from a host on the network. The port is configured for Media Data Interface (MDI). To attach a cable to the 10/100Base-TX port (marked "10/100 MGMT" on the SSR 2100's chassis):

1. Obtain a cable with an RJ-45 connector that has the following pin assignments:

**Table 9. RJ-45 connector pin assignments**

| Signal (SSR 2100 port) | Pin | Signal (management console port) |
|---|---|---|
| TXD (transmit data) | 1 | RXD (receive data)[a] |
| TXD (transmit data) | 2 | RXD (receive data) |
| RXD (receive data) | 3 | TXD (transmit data) |
| Unused | 4 | Unused |
| Unused | 5 | Unused |
| RXD (receive data) | 6 | TXD (transmit data) |
| Unused | 7 | Unused |
| Unused | 8 | Unused |

a. The right hand column pin assignments are for the RJ-45 connector on the SSR 2100. Thus, pin 1 (TXD or "transmit data") must emerge on the management console's end of the connection as RXD ("receive data") and so on.

2. Make sure the TXD signals from the SSR 2100 emerge as RXD signals on the management console and the TXD signals from the management console emerge as RXD signals on the SSR 2100.
3. After ensuring that the pin assignments on both ends of the connection are correct, plug the appropriate end of the connection into the SSR 2100's RJ-45 10/100Base-TX port.
4. Plug the other end of the connection into the management console's port.
5. When you are ready to configure the SSR 2100 using CoreWatch or SNMP, use procedures in Chapter 4, "Installing and Starting Cabletron CoreWatch" on page 43 to start an SNMP or CoreWatch management session.

## Attaching Cables to Gigabit Ports

The 1000Base-SX ports on the Gigabit Modules support multimode fiber (MMF). The Gigabit Modules use SC-style Media Interface Connectors (MICs) to attach to MMF cables.

To attach the segment cables to the Gigabit Modules, obtain an MMF cable with an SC MIC and plug the MIC into the port connector. When you plug the other end of the cable into another device, make sure that the cable connected to the transmit port on the SSR 2100 is connected to the receive port on the other device. The receive port on the SSR 2100 should be connected to the transmit port on the other device.

# Chapter 3

# Software Installation and Setup

This chapter provides the following software installation and basic setup procedures:

- Powering on and booting the software
- Starting the Command Line Interface (CLI)
- Setting basic system information
- Setting up SNMP community strings
- Setting up passwords
- Setting the DNS domain name and address
- Setting SYSLOG parameters
- Loading system image software
- Loading the boot PROM software
- Activating configuration changes and saving the configuration file

## Powering On and Booting the Software

To power on the SSR 2100 and boot the software:

1. Plug the SSR 2100's power supplies into a power source. Assuming that your power source is currently active, the SSR 2100 will automatically power on and attempt to boot using the software image in the motherboard's boot flash.

While the software is booting, the HBT (heartbeat) LED on the chassis flashes. When the software finishes booting, the HBT LED goes dark and the OK LED lights up, indicating that the SSR 2100 software is online. As the software boots, the management console attached to the SSR 2100's DB-9 DCE port displays messages related to the phases of the boot sequence. When the software is fully booted, the following message appears on the management console:

```
Press RETURN to activate console...
```

2. Press Return (or Enter) to activate the CLI on the console.

# Starting the Command Line Interface

To start the Command Line Interface (CLI), power on the system. Startup messages appear on the console (the terminal attached to one of the SSR 2100's ports).

After the software is fully booted and you press Return (or Enter) to activate the CLI, the CLI prompts you for a password. You can define separate passwords for login access and Enable mode. The factory default password for both of these is set to blank. (Simply press Return.)

## Access Modes

The CLI has the following access modes:

- **User** – Allows you to display basic information and use basic utilities such as ping but does not allow you to display SNMP, filter and access control list information, or make other configuration changes. You can tell you are in User mode when the command prompt ends with a "`>`" character.
- **Enable** – Allows you to display SNMP, filter, and access control information as well as all the information you can display in User mode. To enter Enable mode, enter the **enable** command, then supply the password when prompted. When you are in Enable mode, the command prompt ends with a "`#`" character.
- **Configure** – Allows you to make configuration changes. To enter Configure mode, first enter Enable mode (**enable** command), then enter the **configure** command from the Enable command prompt. When you are in Configure mode, the command prompt ends with "`(config)#`."
- **Boot** – This mode appears when the SSR 2100 or the system image is not found during bootup. You should enter the **reboot** command to reset the router. If the SSR 2100 still fails to boot, call Cabletron Technical Support.

  **Note:** The command prompt will show the name of the SSR 2100 in front of the mode character(s). The default name is "ssr". The procedure in "Setting Basic System Information" on page 26 describes how to change the system name.

When you are in Configure or Enable mode, use the **exit** command or press Ctrl+Z to exit to the previous access mode.

**Note:** When you exit Configure mode, the CLI will ask you whether you want to activate the configuration commands you have issued. If you enter **yes** or **y**, the configuration commands you issued are placed into effect and the SSR 2100's configuration is changed accordingly. However, the changes are not written to the Startup configuration file in the SSR 2100's boot flash and therefore are not reinstated after a reboot. See "Upgrading the VFS" on page 38 for information about saving configuration changes.

## Basic Line Editing Commands

The CLI supports EMACs-like line editing commands. The following table lists some commonly used commands. For a complete set of commands, see the *SmartSwitch Router User Reference Manual*.

**Table 10. Some commonly used CLI commands**

| Key sequence | Command |
|---|---|
| Ctrl+A | Move cursor to beginning of line |
| Ctrl+B | Move cursor back one character |
| Ctrl+D | Delete character |
| Ctrl+E | Move cursor to end of line |
| Ctrl+F | Move cursor forward one character |
| Ctrl+N | Scroll to next command in command history (use the **cli show history** command to display the history) |
| Ctrl+P | Scroll to previous command in command history |
| Ctrl+U | Erase entire line |
| Ctrl+X | Erase from cursor to end of line |
| Ctrl+Z | Exit current access mode to previous access mode |

# Setting Basic System Information

Use the procedure in this section to set the following system information:

- System time and date
- System name
- System location
- Contact name (the person to contact regarding this SSR 2100)

**Note:** Some of the commands in this procedure accept a string value. String values can be up a maximum of 255 characters in length, including blank spaces. Surround strings that contain blanks with quotation marks (example: "**string with internal blanks**").

To set the system information:

1. Ensure that you are in Enable mode by entering the **enable** command in the CLI.
2. Use the following commands to set the system time and date and then verify the setting

```
set date year <number> month <month-name> day <day> hour <hour>
  minute <minute> second <second>

system show date
```

Here is an example:

```
ssr# system set date year 1998 month january day 19 hour 11 minute 54
  second 0
Time changed to: Mon Jan 19 11:54:00 1998
ssr# system show date
Current time: Mon Jan 19 11:54:04 1998
```

3. Ensure that you are in Configure mode by entering the **configure** command in the CLI. The commands in Step 4 through Step 10 can be entered only from Configure mode.
4. Use the following commands to set the system name, location, and contact information:

```
system set name "<string>"
system set location "<string>"
system set contact "<string>"
```

Here is an example:

```
ssr(config)# system set name "ssr"
ssr(config)# system set location "Sunnyvale, CA"
ssr(config)# system set contact "John Smith"
```

5. Use the **interface add ip** command to set the IP address and netmask for the en0 Ethernet interface, as shown in the following example:

```
ssr(config)# interface add ip en0 address-netmask 10.50.11.22/16
```

**Note:** The en0 interface is automatically created by the system and is reserved for the SSR 2100's management port.

6. To show the changes accumulated in the scratchpad, enter the **show** command while in Configure mode, as shown in the following example:

```
ssr(config)# show
-EDIT-I-NOCONFIG, the running system has no configuration

******** Non-committed changes in Scratchpad ********
 1*: system set name "ssr"
 2*: system set location "Sunnyvale, CA"
 3*: system set contact "John Smith"
```

When you enter commands in Configure mode, the SSR 2100 does not immediately execute the commands. Instead, the SSR 2100 checks the syntax of the commands and if they are syntactically correct, stores them in a temporary scratchpad in memory. The scratchpad is automatically cleared when you log out of the SSR, so you must activate the changes and then save them to the Startup configuration file to retain the changes, as explained below.

The scratchpad allows you to make configuration changes without worrying about the order in which you issue the commands. Also, if you change your mind about configuration changes you are making, you do not need to incrementally back out of the changes. You can simply choose not to activate them. As you become more familiar with the SSR 2100 and the CLI and begin to make detailed configuration changes, you may find the scratchpad quite useful. For simple changes such as the ones in this procedure, you might instead want to activate the changes as you go, then use CLI commands to view the results of the changes.

7. Enter the **save active** command to activate commands, such as the **"system set..."** commands you used in Step 4, in the scratchpad.

If you exit Configure mode (by entering the **exit** command or pressing Ctrl+Z) before activating any of your changes in the scratchpad, the CLI will ask you whether you want to make the changes in the scratchpad active by displaying the following message:

```
Do you want to make the changes Active [yes]?
```

8. Enter **yes** or **y** to activate the changes.

9. To display the active configuration, enter the **system show active-config** command, as shown in the following example:

```
ssr# system show active-config
Running system configuration:
     !
     ! Last modified from Console on Mon Jan 19 11:55:35 1998
     !
 1 : system set name "ssr"
 2 : system set location "Sunnyvale, CA"
 3 : system set contact "John Smith"
```

   Changes in the active configuration take effect on the running system but will not be restored following a reboot.

10. To ensure that changes are restored following a reboot, you must save the active database to the Startup configuration file by taking the following steps:

    a. Enter the **exit** command to return to Enable mode.

    b. Enter the **copy active to startup** command.

    The CLI displays the following message:

```
Are you sure you want to overwrite the Startup configuration [no]?
```

11. Enter **yes** or **y** to add the active configuration to the Startup configuration file.

**Note:** You also can save active changes to the Startup configuration file from within Configure mode by entering the **save startup** command.

See "Upgrading the VFS" on page 38 for more information about the scratchpad, active database, and Startup configuration.

# Setting Up SNMP Community Strings

To use SNMP to manage the SSR 2100, you need to set up an SNMP community on the SSR 2100. Otherwise, the SSR 2100's SNMP agent runs in local trap process mode until you disable it using the **snmp stop** command. In addition, if you want to be able to access the SNMP traps issued by the SSR 2100's SNMP agent, you need to specify the IP address of the target for the SNMP traps.

To add the SNMP community string and specify the target for traps, take the following steps:

1. Ensure that you are in Enable mode by entering the **enable** command in the CLI.

2. Ensure that you are in Configure mode by entering the **configure** command in the CLI.
3. Use the following commands to add an SNMP community string and set a target for the traps.

```
snmp set community <community-name> privilege read
snmp set target <IP-addr> community <community-name>
```

**Note:** The target IP address must be locally attached to the SSR 2100. You cannot specify a target that is connected to the SSR 2100 by another router. If the IP address is more than one hop away from the SSR 2100, configure the SSR 2100 with a static route to the target so that a cold start trap is sent.

4. Enter the **show** command to examine the changes accumulated in the scratchpad.
5. Enter the **save active** command to activate the commands you entered in the previous steps.
6. To verify the changes, enter the **snmp show all** command.

Here is an example of the commands and output for configuring SNMP and saving the changes.

```
ssr# config
ssr(config)# snmp set community public privilege read-only
ssr(config)# snmp set target 10.50.11.12 community public
ssr(config)# save active
ssr(config)# exit
ssr# snmp show all
SNMP Agent status:
        enabled mode
SNMP Last 2 Clients:
10.50.100.53   Mon Mar 30 10:31:27 1998
10.50.100.43   Mon Mar 30 10:31:22 1998


SNMP Chassis Identity:
not configured.

Trap Table:
Index Trap Target Addr    Community String    Status
----- none configured -----

Traps by Type:
Authentication trap: enabled
Link Up/Down   trap: enabled

Community Table:
Index Community String         Privilege
1.    public                   READ-WRITE


SNMP statistics:
        247019 packets received
                246346 get requests
                745 get-next requests
                184 get-bulk requests
                50 set requests
                0 bad SNMP versions
                1 bad community names
                0 ASN.1 parse errors
                0 PDUs too big
        247018 packets sent
                246346 get responses
                745 get-next responses
                184 get-bulk responses
                50 set responses
```

7. After verifying the SNMP configuration, save the changes to the Startup configuration file by entering the **copy active to startup** command.

Remember to enter **yes** or **y** when the CLI asks you whether you want to overwrite the Startup configuration.

# Setting Up Passwords

You can password protect CLI access to the SSR 2100 by setting up passwords for login access and Enable access. Users who have a login password but not an Enable password can use only the commands available in User mode. Users with an Enable password can use the commands available in Enable and Configure modes as well as the commands in User mode.

In addition, you can set up the SSR 2100 for TACACS and/or RADIUS authentication on login and password by a TACACS or RADIUS server. You can find a section describing configuration of the SSR 2100 for TACACS and RADIUS in the *SmartSwitch Router User Reference Manual*.

**Note:** If a password is configured for Enable mode, the SSR 2100 prompts you for the password when you enter the **enable** command. Otherwise, the SSR 2100 displays a message advising you to configure an Enable password before entering Enable mode. From Enable mode, you can access Configure mode to make configuration changes.

The default password for each access level is blank. (Simply press Enter or Return without entering a password.) If you want to add password protection to the CLI, use the following procedure.

1. Ensure that you are in Enable mode by entering the **enable** command in the CLI.
2. Ensure that you are in Configure mode by entering the **configure** command in the CLI.
3. Use the following command for each password you want to set:

```
system set password login|enable <string>|none
```

4. Enter the **show** command to examine the changes accumulated in the scratchpad.
5. Enter the **save active** command to activate the commands.
6. Enter the **system show active-config** command to verify the active changes.

Here is an example of the commands in the previous steps:

```
ssr(config)# system set password login demo
ssr(config)# system set password enable demo
ssr(config)# save active
ssr# exit
ssr# system show active-config

Running system configuration:
!
! Last modified from Console on Mon Jan 19 12:12:19 1998
!
 1 : system set name "ssr"
 2 : system set location "Sunnyvale, CA"
 3 : system set contact "John Smith"
 4 : system set hashed-password login jNIssH c976b667e681d03ccd5fc527f219351a
 5 : system set hashed-password enable zcGzbO 5d1f73d2d478ceaa062a0b5e0168f46a
 6 : snmp set community public privilege read
 7 : snmp set target 10.50.11.12 community public
```

**Caution:** Test all the new passwords before saving the active configuration to the Startup configuration file. As shown in the example above, the passwords are shown in the active configuration in an encrypted format and will also appear this way in the Startup configuration.

To keep your passwords secure, the SSR 2100 does not have a command for displaying passwords. If you forget a password, you can remove the password by entering the following command while in Configure mode. (See the *SmartSwitch Router Command Line Interface Reference Manual* for more information.)

```
system set password login|enable none
```

# Setting the DNS Domain Name and Address

If you want the SSR 2100 to be able to access a DNS server, use the following procedure to specify the domain name and IP address for the DNS server.

1. Ensure that you are in Enable mode by entering the **enable** command in the CLI.

2. Use the following command to verify that the SSR 2100 can reach the DNS server by pinging the server, as shown in the following example:

```
ssr# ping 10.50.11.12
PING 10.50.11.12 (10.50.11.12): 56 data bytes
64 bytes from 10.50.11.12: icmp_seq=0 ttl=255 time=0 ms

--- 10.50.11.12 ping statistics ---


1 packets transmitted, 1 packets received, 0% packet loss
round-trip min/avg/max = 0/0/0 ms
```

3. Ensure that you are in Configure mode by entering the **configure** command in the CLI.

4. If you have not done so already, use the **interface add ip** command to set the IP address and netmask for the en0 Ethernet interface, as shown in the following example:

```
ssr(config)# interface add ip en0 address-netmask 10.50.11.22/16
```

**Note:** The en0 interface is automatically created by the system and is reserved for the SSR 2100's management port.

5. Use the following command to specify the domain name for which the DNS server(s) have authority:

```
system set dns domain <domain-name>
```

where <*domain-name*> is your specified domain name (example: **cabletron.com**).

6. Use the following command to "add" one or more DNS servers to the SSR 2100:

```
system set dns server ["]<IP-address> [<IP-address>] [<IP-address>]["]
```

where <*IP-address*> is the IP address of the DNS server. You can specify up to three DNS servers.

**Note:** If you specify more than one IP address, you must separate the addresses with a space and surround them with a single pair of quotes. You do not need to surround a single IP address with quotes.

7. Enter the **save active** command to activate the commands and enter **yes** or **y** to activate the changes.

Here is an example of the commands above featuring the addition of two DNS server IP addresses:

```
ssr# config
ssr(config)# system set dns domain "mktg.cabletron.com"
ssr(config)# system set dns server "10.50.11.12 10.50.12.11"
ssr(config)# save active
```

8. Enter the **system show dns** command to verify the new DNS settings, as shown in the following example:

```
ssr# system show dns
DNS domain: cabletron.com, DNS server(s): 10.50.11.12 10.50.12.11
```

9. Use the **ping** command to verify that the SSR 2100 can resolve the DNS server name into its IP address, as shown in the following example:

```
ssr# ping ssr1
PING ssr1.mktg.cabletron.com (10.50.11.12): 56 data bytes
64 bytes from 10.50.11.12: icmp_seq=0 ttl=255 time=0 ms

--- ssr1.mktg.cabletron.com ping statistics ---
1 packets transmitted, 1 packets received, 0% packet loss
round-trip min/avg/max = 0/0/0 ms
```

# Setting SYSLOG Parameters

The CLI can use SYSLOG messages to communicate the following types of messages to a SYSLOG server:

- **Fatal** – Provide information about events that caused the SSR 2100 to crash and reset.
- **Error** – Provide information about errors.
- **Warning** – Provide warnings against invalid configuration information and other conditions that are not necessarily errors. This is the default.
- **Informational** – Provide informational messages such as status messages. The SYSLOG messages that the SSR 2100 displays while booting the software and reading the startup configuration file are examples of Informational messages.

The SSR 2100 writes the SYSLOG messages to a SYSLOG daemon on UDP port 514. You can set the CLI to send all or only some of the message types. By default, the CLI sends warning, error, and fatal messages but not informational messages to the specified SYSLOG server.

Use the following procedure to specify the SYSLOG server and the types of messages you want the CLI to log on the server.

1. Ensure that you are in Enable mode by entering the **enable** command in the CLI.
2. Use the following command to verify that the SSR 2100 can reach the SYSLOG server by pinging the server:

```
ping <IP-addr>
```

3. Ensure that you are in Configure mode by entering the **configure** command in the CLI.
4. If you have not already done so, use the **interface add ip** command to set the IP address and netmask for the en0 Ethernet interface, as shown in the following example:

```
ssr(config)# interface add ip en0 address-netmask 10.50.11.22/16
```

**Note:** The en0 interface is automatically created by the system and is reserved for the SSR 2100's management port.

5. Use the following commands to "add" the SYSLOG server to the SSR 2100, set the message level, and set the SYSLOG facility:

```
system set syslog server <hostname-or-IP-addr>
system set syslog level fatal|error|warning|info
system set syslog facility <facility-type>
```

Here is an example:

```
ssr# config
ssr(config)# system set syslog server 10.50.11.12
ssr(config)# system set syslog level info
ssr(config)# system set syslog facility local0
```

6. Enter the **show** command to show the commands you just entered. Because you have not activated these configuration changes yet, they are listed in the scratchpad section of the output. Here is an example:

```
ssr(config)# show
Running system configuration:
!
! Last modified from Console on Mon Jan 19 12:37:21 1998
!
 1 : interface add ip en0 address-netmask 10.50.11.22/16
!
 2 : system set dns server 10.50.11.12
 3 : system set dns domain mktg.cabletron.com
 4 : system set name "ssr"
 5 : system set location "Sunnyvale, CA
 6 : system set contact "John Smith"
 7 : system set hashed-password login jNIssH c976b667e681d03ccd5fc527f219351a
 8 : system set hashed-password enable zcGzbO 5d1f73d2d478ceaa062a0b5e0168f46a
!
 9 : snmp set community public privilege read
10 : snmp set target 10.50.11.12 community public

******** Non-committed changes in Scratchpad ********
 1*: system set syslog server 10.50.11.12
 2*: system set syslog level info
 3*: system set syslog facility local0
```

**Note:** The other configuration changes made during this CLI session are also listed. Active changes are listed in the "Running system configuration section" and unactivated changes are listed in the "Non-committed changes in Scratchpad" section.

7. To activate the SYSLOG commands, enter the **save active** command.

# Loading System Image Software

The SSR 2100 operates using the system image software installed in its internal flash chip. To upgrade the system software and operate using the upgraded image, go through the following procedure:

1. Display the current boot settings by entering the **system show version** command, as shown in the following example:

```
ssr# system show version
Software Information
  Software Version   : 2.2.0.0
  Copyright          : Copyright (c) 1998 Cabletron Systems, Inc.
  Image Information  : Version 2.2.0.0, built on Thu Jul 30 01:16:15 1999
  Image Boot Location: tftp://10.50.89.88/ssr2200
  Boot Prom Version  : prom-1.1.0.5
```

**Note:** In this example, the location "pc-flash" indicates that the SSR 2100 is set to use the factory-installed system software in the motherboard's internal flash chip.

2. Copy the software upgrade you want to install onto a TFTP server that the SSR 2100 can access. (Use the **ping** command to verify that the SSR can reach the TFTP server.)

3. Use the following command to copy the software upgrade onto the internal flash chip in the SSR 2100:

```
system image add <IPaddr-of-TFTP-host> <image-file-name>
```

Here is an example:

```
ssr# system image add 10.50.11.12 ssr2000
Downloading image 'ssr2200' from host '10.50.11.12'
 to local image ssr2200 (takes about 3 minutes)
kernel: 100%
Image checksum validated.
Image added.
```

4. Enter the **system image list** command to verify that the new image exists on the internal flash chip, as shown in the following example:

```
ssr# system image list
Images currently available:
ssr2200
```

5. Use the following command to select the image file the SSR 2100 will use the next time you reboot the switch.

```
system image choose <file-name>
```

Here is an example:

```
ssr# system image choose ssr2200
Making image ssr2200 the active image for next reboot
```

6. Enter the **system image list** command to verify the change.

**Note:** You do not need to activate this change.

# Loading Boot PROM Software

The SSR boots using the boot PROM software installed in the SSR 2100's internal memory. To upgrade the boot PROM software and boot using the upgraded image, use the following procedure.

1. Display the current boot settings by entering the **system show version** command, as shown in the following example:

```
ssr# system show version
Software Information
  Software Version   : 2.2.0.0
  Copyright          : Copyright (c) 1998 Cabletron Systems, Inc.
  Image Information  : Version 2.2.0.0, built on Thu Jul 30 01:16:15 1999
  Image Boot Location: tftp://10.50.89.88/ssr2200
  Boot Prom Version  : prom-1.1.0.5
```

   **Note:** In this example, the location "pc-flash" indicates that the SSR 2100 is set to use the factory-installed software in the motherboard's internal flash chip.

2. Copy the software upgrade you want to install onto a TFTP server that the SSR 2100 can access. (Use the **ping** command to verify that the SSR can reach the TFTP server.)

3. Use the following command to copy the boot PROM upgrade into the SSR 2100's internal memory:

```
system promimage upgrade <IPaddr-of-TFTP-host> <image-file-name>
```

   Here is an example:

```
ssr# system promimage upgrade 10.50.11.12 prom2
Downloading image 'prom-1.1.0.5' from host '10.50.11.12'
 to local image prom-1.1.0.5 (takes about 3 minutes)
kernel: 100%
Image checksum validated.
Image added.
```

4. Enter the **system show version** command to verify that the new boot PROM software is on the internal memory of the SSR 2100.

# Upgrading the VFS

A new VFS file system called VFS2 is now available. The new VFS2 dramatically decreases the time required for deleting and adding system images.

**Note:** Upgrading the file system to VFS2 will **not** erase your configuration image.

The new VFS2 file system is only compatible with:

- boot PROM version v.1.1.0.8
- system image version 3.1 or later

To upgrade the VFS file system to VFS2, perform the following steps:

1. Upgrade the firmware to release version 3.1 or later.

2. Upgrade the bootprom to version v.1.1.0.8. See "Loading Boot PROM Software" on page 37 for instructions on upgrading the software.
3. Reboot.
4. Press **esc** during bootup to enter the bootprom mode.
5. Type **pcmakeversion2** to convert your old VFS1 flash card into a new VFS2 file system.
6. Reboot.

# Activating Configuration Changes and Saving the Configuration File

The SSR 2100 uses three special configuration files:

- **Active** – The commands from the Startup configuration file and any configuration commands that you have made active from the scratchpad (see below).

**Caution:** The active configuration remains in effect only during the current power cycle. If you power down or reboot the SSR 2100 without saving the active configuration changes to the Startup configuration file, the changes are lost.

- **Startup** – The configuration file that the SSR 2100 uses to configure itself when the system is powered on.
- **Scratchpad** – The configuration commands you have entered during a management session. These commands do not become active until you explicitly activate them. Because some commands depend on other commands for successful execution, the SSR 2100 scratchpad simplifies system configuration by allowing you to enter configuration commands in any order, even when dependencies exist. When you activate the commands in the scratchpad, the SSR 2100 sorts out the dependencies and executes the command in the proper sequence.

## Activating the Configuration Commands in the Scratchpad

The configuration commands you have entered using procedures in this chapter are in the Scratchpad but have not yet been activated. Use the following procedure to activate the configuration commands in the scratchpad:

1. Ensure that you are in Enable mode by entering the **enable** command in the CLI.
2. Ensure that you are in Configure mode by entering the **configure** command in the CLI.
3. Enter the **save active** command.

   If you exit Configure mode (by entering the **exit** command or pressing Ctrl+Z) before activating any of your changes in the scratchpad, the CLI will ask you whether you

want to make the changes in the scratchpad active by displaying the following message:

```
Do you want to make the changes Active [yes]?
```

4. Enter **yes** or **y** to activate the changes.

## Saving the Active Configuration to the Startup Configuration File

After you save the configuration commands in the scratchpad, the SSR 2100 executes the commands and makes the corresponding configuration changes. However, if you power down or reboot the SSR 2100, the new changes are lost. Use the following procedure to save the changes into the Startup configuration file so that the SSR 2100 reinstates the changes when you reboot the software.

1. Ensure that you are in Enable mode by entering the **enable** command in the CLI.
2. Enter the **copy active to startup** command to copy the configuration changes in the Active configuration to the Startup configuration.

   The CLI displays the following message:

```
Are you sure you want to overwrite the Startup configuration [no]?
```

3. Enter **yes** or **y** to save the changes.

**Note:** You also can save active changes to the Startup configuration file from within Configure mode by entering the **save startup** command.

The new configuration changes are added to the Startup configuration file stored in the SSR 2100's boot flash.

## Viewing the Current Configuration

If you want to view the current configuration:

1. Ensure that you are in Enable mode by entering the **enable** command in the CLI.
2. Enter the following command to display the status of each command line:

```
system show active-config
```

   The CLI displays the active configuration file with the following possible annotations:

   – Commands without errors are displayed without any annotation.

   – Commands with errors are annotated with an "E".

– If a particular command has been applied such that it can be expanded on additional interfaces/modules, then it is annotated with a "P". For example, if you enabled STP on all ports in the current system, however, the SSR contains only one module, then that particular command could be expanded at a later date when more modules have been added to the SSR.

  A command like **stp enable et.*.*** would be displayed as follows:

```
P: stp enable et.*.*
```

  indicating that it is only partially applied. If you add more modules to the SSR at a later date and then update the configuration file to encompass all of the available modules in the SSR, then the "P:" portion of the above command line would disappear when displaying this configuration file.

  If a potentially partial command, which was originally configured to encompass all of the available modules on the SSR, becomes only partially activated (after a hotswap or some such chassis reconfiguration), then the status of that command line will automatically change to indicate a partial completion status, complete with "P:".

**Note:** Commands with no annotation or annotated with a "P:" are not in error.

# Chapter 4

# Installing and Starting Cabletron CoreWatch

This chapter:

- Provides an overview of Cabletron CoreWatch, a Java-based graphical user interface (GUI) you can use to monitor and configure your SmartSwitch Router
- Discusses the browser and hardware requirements of CoreWatch
- Explains installing the CoreWatch software
- Describes starting CoreWatch

## What Is Cabletron CoreWatch?

Cabletron CoreWatch is a comprehensive, easy-to-use, network management and device configuration application for SSRs. Based on Java, CoreWatch provides configuration, monitoring, and reporting capabilities with the assistance of wizards and drag-and-drop operations. Cabletron CoreWatch simplifies tasks such as configuring routers, VLANs, security filters, and setting up application-level QoS policies.

Cabletron CoreWatch management features include:

- Java-based GUI
- Simplified routing configuration
- Intuitive QoS management
- Configuration of security filters and ACLs
- Drag-and-drop VLAN setup and administration
- Extensive performance monitoring

- Comprehensive configuration using wizards and drag-and-drop operation
- Detailed HTML-based reporting

# System Requirements

Cabletron CoreWatch can run in the Solaris, Windows NT, and Windows 95/98 environments. As shown in the following table, CoreWatch's system requirements depend on your operating system. The table identifies which browser to use with each operating system and gives the minimum hardware requirements for each environment.

| | **Solaris 2.5.1 or 2.6** | **Windows NT 4.0x** | **Windows 95/98** |
|---|---|---|---|
| **Browser** | Netscape Navigator 3.0 or above | Netscape Navigator 3.0 or above, or Microsoft Internet Explorer 4.0 or above | Netscape Navigator 3.0 or above, or Microsoft Internet Explorer 4.0 or above |
| **CPU** | Sparc20 or above | Pentium 133 or above | Pentium 133 or above |
| **RAM** | 128 MB | 64 MB | 64 MB |
| **Disk** | 40 MB Free | 20 MB Free | 20 MB Free |

# Installing Cabletron CoreWatch

You can install CoreWatch on a Solaris 2.5.1 or Solaris 2.6 running CDE, Windows NT, Windows 95, or Windows 98 system. The method you use to install CoreWatch depends on your environment. Separate discussions on installing CoreWatch in the Solaris or Windows environments follow.

**Note:** Cabletron CoreWatch requires CDE to run properly on Solaris 2.5.1 and 2.6 operating systems. Ensure that your Solaris system includes CDE before attempting to run CoreWatch.

## Installing on a Solaris System

To install CoreWatch from a CD onto a Solaris 2.5.1 or 2.6 system:

1. If you plan to integrate CoreWatch with HP OpenView, be sure the HP OpenView daemon is running. For details, see your HP OpenView documentation.
2. Insert the CoreWatch CD into your CD-ROM drive.

3. Log in as super user by entering the following command:

```
% su - root
```

4. Ensure that you are in the appropriate subdirectory to access the CD-ROM by entering the following command:

```
# cd /cdrom/cdrom0
```

5. Run the CoreWatch installation script by entering the following command:

```
# install.sh
```

   Cabletron CoreWatch is installed on your system in the **/opt/CScw** directory.

6. Add **/opt/CScw/bin** to your environment path.

   For details on adding items to a path, see your Solaris documentation.

## Installing on a Windows NT or Windows 95/98 System

**Note:** You must have Admin privileges to install CoreWatch on a Windows NT system.

To install CoreWatch on a Windows NT or Windows 95/98 system:

1. If you plan to integrate CoreWatch with HP OpenView on a Windows NT system, be sure the HP OpenView daemon is running. For details, see your HP OpenView documentation.
2. Insert the CoreWatch CD into your CD-ROM drive and double-click on the **install.bat** icon. The CoreWatch installation wizard appears.
3. Click **Next**.
4. After reviewing the license agreement, click **Yes** to accept it.
5. Enter your name and your company's name in the appropriate text boxes. Then click **Next**.
6. Specify the folder in which you want to install the software and click **Next**.

   You can keep the default folder or click **Browse** and then browse to another folder.

7. Set up the type of installation by doing one of the following:
   - Choose **Typical** to install the most common options.
   - Choose **Compact** to install the minimum files needed to run CoreWatch.

– Choose **Custom** and click **Next** if you are an advanced user and want to specify which files to install. Options with a check mark will be installed. Click to the left of an item to select or clear its check box.

8. Click **Next**.
9. Specify a name for the CoreWatch program group, which is Cabletron CoreWatch by default. Then click **Next**.
10. When the Explorer window reappears, close it.
11. Click **Finish** to complete the installation.

# Starting Cabletron CoreWatch

The method you use to start CoreWatch depends on whether you installed it in the Solaris or Windows environment. If you choose to integrate CoreWatch with HP OpenView or Cabletron SPECTRUM during installation, you can start CoreWatch from within either environment in both Solaris and Windows NT/Windows 95/98.

Separate discussions on starting CoreWatch in the Solaris and Windows environments and from within SPECTRUM or HP OpenView follow.

## Starting CoreWatch in Solaris

To start CoreWatch in the Solaris 2.5.1 or 2.6 environment, enter the following command at the Solaris prompt:

```
% CoreWatch -a <IPaddr> -r <community-string>
```

where <*ipaddr*> is the IP address of the SSR and <*community-string*> is the SSR's community string. If you do not know this information, see your network administrator.

**Notes:**

- If the **CoreWatch** command is not found, you can locate it in **/opt/CScw/bin**.
- If you do not supply the <*ipaddr*> and the <*community-string*> parameters, the CoreWatch **Login Dialog** box appears and prompts you for them.

## Starting CoreWatch in Windows NT or Windows 95/98

To start CoreWatch in the Windows NT or Windows 95/98 environment:

1. Select the **Start** menu, choose **Programs**, choose **CoreWatch**, and then choose **CoreWatch**. The **Login Dialog** box appears.

**Note:** If you installed the program in a startup folder other than **Programs → CoreWatch**, select that folder from the **Start** menu and then select **CoreWatch**.

2. Type the name or IP address and community string for the SSR. If you do not know this information, see your network administrator.
3. Click **OK**.

Alternately, you can start CoreWatch by selecting the **Start** menu, choosing **Run...**, and entering the following command in the **Run** dialog box:

```
C:\Program Files\Cabletron\BIN\CoreWatch -a <IPaddr> -r <community-string>
```

where <*ipaddr*> is the IP address of the SSR and <*community-string*> is the SSR's community string. If you do not know this information, see your network administrator.

## Starting CoreWatch from within SPECTRUM Enterprise Manager

Cabletron SPECTRUM Enterprise Manager is an object-oriented network management platform. SPECTRUM, which is available on Solaris and Windows NT, provides a suite of bundled applications as well as additional optional applications. The SSR is modeled in SPECTRUM using the SmartSwRtr model type. The SSR can be Auto-Discovered or manually created in a SPECTRUM Topology View and then copied to an Organization and/or Location View.

To start CoreWatch from within SPECTRUM:

1. Start SPECTRUM.
2. If you know the topology location for your model, proceed to that location. Otherwise, open the Find View by choosing the **View** menu, selecting **New View**, and then selecting **Find**. Select **Model-Type Name** and enter the **SmartSwRtr** command to display all the SmartSwRtr models or select **Network Address** to display a particular model.
3. Bring up the menu for the SmartSwRtr model and select **CoreWatch**.

This starts CoreWatch using the SmartSwRtr model's network address and community name.

# Appendix A

# Troubleshooting

If you experience difficulty with the basic hardware or software setup procedures in this guide, check the following table to see whether the difficulty you are experiencing is described. If you find a description of the difficulty you are experiencing, try the resolution(s) recommended for the difficulty.

If the resolution does not remove the difficulty or the difficulty is not listed in this appendix, see Appendix B, "Technical Support" on page 51 for information about contacting Cabletron Systems or your reseller for technical support.

| If you experience this difficulty | Try this remedy |
|---|---|
| The SSR 2100 exhibits no activity (no LEDs are on, the fan module is not operating, and so on). | Make sure the SSR 2100 is plugged into a power source and the power source is active. |
| The power supply is installed but is not operating. | Check the power cable and the circuit to which the SSR 2100 is connected. |
| The fan is not active. | Check the power cable and the circuit to which the SSR 2100 is connected. |
| No Gigabit Modules are active. | Check the power cable and the circuit to which the SSR 2100 is connected. |
| An older software version continues to boot instead of the newer version on a TFTP server. | Use the procedure in "Loading System Image Software" on page 36 to configure the SSR 2100 to boot using newer software. |
| You are unable to access the configuration commands in the CLI. | From the CLI, type **enable** to access Enable mode, then type **configure** to access Configure mode. |
| Configuration changes do not seem to be taking effect. | Use the procedure in "Activating the Configuration Commands in the Scratchpad" on page 39 to activate the changes. |

| If you experience this difficulty | Try this remedy |
|---|---|
| Configuration changes are not reinstated after a reboot. | Use the procedure in "Saving the Active Configuration to the Startup Configuration File" on page 40 to save the configuration changes to the Startup configuration file. |
| CoreWatch cannot access the SSR 2100. | Make sure you have properly installed CoreWatch and check the network connection between the CoreWatch management station and the SSR 2100. |
| The SSR 2100 is not resolving DNS names. | Use the procedure in "Setting the DNS Domain Name and Address" on page 32 to set up DNS.<br><br>If you have already performed this procedure, make sure you can use NS lookup on the DNS server to get the default domain. |
| An SNMP manager cannot access the SSR 2100. | Use the procedure in "Setting Up SNMP Community Strings" on page 28 to set up an SNMP community string and specify a target for SNMP traps.<br><br>If you have already performed this procedure, type **snmp show all** in the CLI to check the SNMP settings.<br><br>Use the **traceroute** and **ping** commands to verify that the SSR 2100 can reach the SNMP management station. |
| You are unable to ping a certain host. | Create and add an IP or IPX interface for the host. See the *SmartSwitch Router User Reference Manual* for information. |

# Appendix B

# Technical Support

This appendix tells you what to do if you need technical support for your SSR.

Cabletron offers several important support and service programs that provide high-quality support to our customers. For technical support, first contact your place of purchase. If you need additional assistance, contact Cabletron Systems, Inc. There are several easy ways to reach Cabletron Customer Support and Service.

## Telephone Assistance

Our Technical Support Center is available Monday through Friday, 8am to 8pm Eastern Time, by calling (603) 332-9400.

## FAX Service

You can fax support questions to us at any time at 603-337-3075.

## Electronic Services

You can contact Cabletron's Bulletin Board Service by dialing 603-335-3358.

Our internet account can be reached at support@ctron.com.

You can reach the Cabletron FTP site:

ftp://ftp.cabletron.com
Login: *anonymous*
Password: *your email address*

To send comments or suggestions concerning this document, contact the Cabletron Systems Technical Writing Department via the following email address: **TechWriting@cabletron.com**. Make sure to include the document Part Number in the email message.

You can also check our home pages on the World Wide Web.

- http://www.cabletron.com
- http://www.ctron.com

# Placing a Support Call

**Before calling Cabletron Systems, have the following information ready:**

- Your Cabletron Systems service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem (e.g., changing mode switches, rebooting the unit, etc.)
- The serial and revision numbers of all involved Cabletron Systems products in the network
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)
- Any previous Return Material Authorization (RMA) numbers

# Hardware Warranty

Cabletron warrants its products against defects in the physical product for one year from the date of receipt by the end user (as shown by Proof of Purchase). A product that is determined to be defective should be returned to the place of purchase. For more detailed warranty information, please consult the Product Warranty Statement received with your product.

# Software Warranty

Cabletron software products carry a 90-day software warranty. During this period, customers may receive updates and patches for verified, reported software issues.

# Repair Services

Cabletron offers an out-of-warranty repair service for all our products at our Santa Clara Repair Facility. Products returned for repair will be repaired and returned within 5 working days. A product sent directly to Cabletron Systems, Inc. for repair must first be assigned a Return Material Authorization (RMA) number. A product sent to Cabletron Systems, Inc., without an RMA number displayed outside the box will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, contact Cabletron Technical Support. When you call for an RMA number, your support representative will spend a few minutes with you, making sure the board is defective. Once they confirm that the board is defective, they will assign an RMA number. Payment, shipping instructions, and turnaround time will be confirmed when the RMA number is assigned.

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